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ENVIRONMENTAL ASSESSMENT BOARD

VOLUME: XXVII

DATE: Tuesday, July 12th, 1988

BEFORE:

M.I. JEFFERY, Q.C., Chairman

E. MARTEL, Member

A. KOVEN, Member

FOR HEARING UPDATES CALL (TOLL-FREE): 1-800-387-8810



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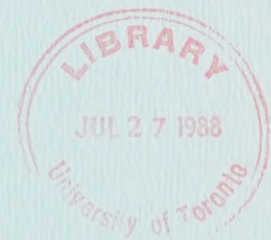
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HEARING ON THE PROPOSAL BY THE MINISTRY OF NATURAL
RESOURCES FOR A CLASS ENVIRONMENTAL ASSESSMENT FOR
TIMBER MANAGEMENT ON CROWN LANDS IN ONTARIO

IN THE MATTER of the Environmental
Assessment Act, R.S.O. 1980, c.140;

- and -

IN THE MATTER of the Class Environmental
Assessment for Timber Management on Crown
Lands in Ontario;

- and -

IN THE MATTER of an Order-in-Council
(O.C. 2449/87) authorizing the
Environmental Assessment Board to
administer a funding program, in
connection with the environmental
assessment hearing with respect to the
Timber Management Class
Environmental Assessment, and to
distribute funds to qualified
participants.

Hearing held at the Ramada Prince Arthur
Hotel, 17 North Cumberland St., Thunder
Bay, Ontario, on Tuesday, July 12th, 1988,
commencing at 9:30 a.m.

VOLUME XXVII

BEFORE:

MR. MICHAEL I. JEFFERY, Q.C.	Chairman
MR. ELIE MARTEL	Member
MRS. ANNE KOVEN	Member

A P P E A R A N C E S

MR. V. FREIDIN, Q.C.)	MINISTRY OF NATURAL
MS. C. BLASTORAH)	RESOURCES
MS. K. MURPHY)	
MR. B. CAMPBELL)	MINISTRY OF ENVIRONMENT
MS. J. SEABORN)	
MR. R. TUER, Q.C.)	ONTARIO FOREST INDUSTRY
MR. R. COSMAN)	ASSOCIATION and ONTARIO
MS. E. CRONK)	LUMBER MANUFACTURERS'
MR. P.R. CASSIDY)	ASSOCIATION
MR. J. WILLIAMS, Q.C.	ONTARIO FEDERATION OF
	ANGLERS & HUNTERS
MR. D. HUNTER	NISHNAWBE-ASKI NATION
	and WINDIGO TRIBAL COUNCIL
MR. J.F. CASTRILLI)	
MS. M. SWENARCHUK)	FORESTS FOR TOMORROW
MR. R. LINDGREN)	
MR. P. SANFORD)	KIMBERLY-CLARK OF CANADA
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MR. B. MCKERCHER)	OUTFITTERS ASSOCIATION
MR. L. GREENSPOON)	NORTHWATCH
MS. B. LLOYD)	

APPEARANCES: (Cont'd)

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MR. B. BABCOCK)	MUNICIPAL COMMITTEE
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	DEVELOPMENT & MINES
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	WATCHDOG SOCIETY
MR. R.L. AXFORD	CANADIAN ASSOCIATION OF
	SINGLE INDUSTRY TOWNS
MR. M.O. EDWARDS	FORT FRANCES CHAMBER OF
	COMMERCE
MR. P.D. McCUTCHEON	GEORGE NIXON

(iii)

APPEARANCES: (Cont'd)

MR. C. BRUNETTA

NORTHWESTERN ONTARIO
TOURISM ASSOCIATION

I N D E X O F P R O C E E D I N G S

<u>Witness:</u>	<u>Page No.</u>
<u>JOHN EDWARD OSBORN,</u> <u>KENNETH A. ARMSON,</u> Resumed	4580
Continued Cross-Examination by Mr. Castrilli	4582
Cross-Examination by Ms. Seaborn	4616

(v)

I N D E X O F E X H I B I T S

<u>Exhibit No.</u>	<u>Description</u>	<u>Page No.</u>
132	Document prepared by Dr. Osborn called: Sampling Error.	4580
133	Document entitled: Operational Survey, Instructions for Recording Procedures dated June 28, 1983.	4674

1 ---Upon commencing at 9:35 a.m.

2 THE CHAIRMAN: Good morning. Please be
3 seated.

4 Mr. Castrilli?

5 MR. CASTRILLI: Mr. Chairman, I
6 understand that Dr. Osborn wanted to complete an answer
7 to one of my questions that he began yesterday. I
8 would be content to let him begin the morning with that
9 answer.

10 THE CHAIRMAN: Very well.

11 DR. OSBORN: (handed)

12 MR. CASTRILLI: I haven't seen what he is
13 handing out, however.

14 THE CHAIRMAN: It looks like Greek to me.

15 DR. OSBORN: For that I apologize, sir,
16 for first thing in the morning.

17 THE CHAIRMAN: Do you have any objections
18 to this going in, Mr. Castrilli?

19 MR. CASTRILLI: With one caveat. If it
20 goes in now today, I would like to reserve the
21 opportunity to cross-examine Dr. Osborn on this
22 document in Panel 4. I'm simply not going to be in a
23 position -- having just seen it for the first time this
24 morning.

25 If that's acceptable, I have no

1 objections.

2 JOHN EDWARD OSBORN,
3 KENNETH A. ARMSON, Resumed

4 THE CHAIRMAN: Very well. We will mark
5 this Exhibit 132.

6 What do you want to call this Dr. Osborn?

7 DR. OSBORN: Sampling error. Just call
8 it sampling error.

9 ---EXHIBIT NO. 132: Document prepared by Dr. Osborn
10 called: Sampling error.

11 DR. OSBORN: The document comes out of a
12 question which was asked of me yesterday about the
13 arithmetic of sampling and the arithmetic of the error.
14 And what I wanted to do with the document --

15 THE CHAIRMAN: Excuse me a second. I am
16 not sure whether your microphone is on.

17 DR. OSBORN: Yes, yes, yes.

18 THE CHAIRMAN: Okay.

19 DR. OSBORN: What I was hoping to do with
20 the document was to try and confirm or explain some
21 arithmetic that was proposed to me yesterday to point
22 out that as the number of samples change, the error
23 changes. And, as I said yesterday, not in exactly
24 linear one-to-one relationship which was one of the
25 inferences that came out yesterday. And, secondly,

1 there was a discussion yesterday about what happens if
2 we change the value of T and to demonstrate the impact
3 of changing the value of T.

4 So those were the two issues I was asked
5 about and that's what I wanted to try and show with
6 this document which is a condensation of some pieces I
7 put on the paper at this point in time.

8 On the paper at the top of the page is
9 this equation that says: $N \text{ equals } T \text{ squared, } CV$
10 squared over E per cent squared which is the equation I
11 started with in the evidence-in-chief. That's the
12 first equation on this piece of paper which may or may
13 not be recognized.

14 The second equation merely is
15 algebraically moving E per cent squared to this side
16 and the N over to that side. So that's algebraically
17 how we end up with what is the error for the number of
18 samples. This is E per cent squared. We want to find
19 what E is, it's the square root of the right-hand side
20 of the equation.

21 So on the top line of the exhibit you
22 have, we have got the equation $2E \text{ per cent squared}$
23 equals $T \text{ squared, } CV \text{ squared over } N$.

24 Just algebraically how do we go from what
25 was given, equation one to equation two to work out

1 what the error is.

2 And in this equation, the right-hand side
3 of equation three on this exhibit on this piece of
4 paper, all that's really going to change, if I
5 understand Mr. Castrilli correctly, is the number of
6 samples, N will change, the other values are a constant
7 initially and that will be the left-hand side of
8 Exhibit 122 -- 132.

9 CONTINUED CROSS-EXAMINATION BY MR. CASTRILLI:

10 Q. Dr. Osborn, I am wondering, would you
11 be able to reproduce that page as you have now shown on
12 the screen?

13 DR. OSBORN: A. This page is reproduced
14 on Exhibit 132. The arithmetic on the left-hand side
15 going: 10, 20, 30 -- in fact I have got more volumes
16 on 132 than are given on this sheet of paper.

17 Q. But not in the format.

18 A. You mean these two headings?

19 Q. It is just difficult to read from
20 this distance.

21 A. I can have this reproduced.

22 Q. Thank you.

23 A. Again, I am just coming back to help
24 with your arithmetic, something that you worked out to
25 show me yesterday.

1 Q. Dr. Osborn, just respond to the
2 question.

3 A. If we look just at the black numbers
4 for a moment - we will come to the red numbers in a
5 moment - but the black numbers deal with the values of
6 T squared and CV squared that were given before. T was
7 2 CV was 40. And we have shown on the previous page
8 that E per cent squared is equal to T squared CV
9 squared over N and E was the square root of that value.
10 So the arithmetic to reach that value.

11 The number of samples: I was asked what
12 would happen if we took 10 samples, 20, samples, 30
13 samples and what happens to the error is the error --
14 and I was asked whether I would accept plus or minus 25
15 per cent which is the answer if we took 10 samples.

16 So if you take 10, the error turns out as
17 25 and that was presented yesterday by Mr. Castrilli,
18 agreed.

19 If you take 20 samples as Exhibit 132
20 shows, the error is 17.9. And then 132 continues,
21 we're changing the number of samples in Exhibit 132 in
22 the left-hand column 10, 20, 30, 40, 50, the number of
23 samples under N. And as that changes, the error which
24 is given in the essentially third column on Exhibit
25 132, the error goes: 25, 17.9, 14.6 until the bottom

1 value in Exhibit 132 is the error at a hundred samples
2 is 8.

3 And if you recall, when we had the
4 evidence-in-chief, I said for 256 the error would be
5 plus or minus 5 per cent. So the black numbers
6 indicate that if you keep everything else constant and
7 you change the number of samples, the error will
8 change, as was explained, coming in a curvilinear - it
9 isn't a straight line - curvilinear fashion and the
10 observation to make - and I will answer the question -
11 I was also asked: What happens if we change T equals
12 1, and the right-hand side of Exhibit 132 has a
13 statement that says: If T equals 1, what is T squared
14 CV squared and the same arithmetic is gone through.

15 Q. Now, Dr. Osborn, I never asked you if
16 you would change T from 2 to 1. I accepted your number
17 as 2. So I am not sure what the purpose of this part
18 of your answer is.

19 A. I apologize I was not sure exactly
20 what you asked me and I will ignore what's on the
21 right-hand side of the page.

22 Q. Does that complete your answer?

23 A. That explains what happens when you
24 change the number of samples, what happens to the
25 error.

1 Q. Did you want to make the first page of
2 your flip chart an exhibit?

3 A. Given that the equation is in the top
4 and the explanation that we covered in Exhibit 132...

5 Q. It is not necessary.

6 A. I don't think so, but it is up to the
7 Board.

8 THE CHAIRMAN: I do not think it is. It
9 is all on the one sheet.

10 MR. CASTRILLI: That's fine.

11 DR. OSBORN: Yes, sir.

12 THE CHAIRMAN: So I think that is
13 sufficient.

14 MR. CASTRILLI: Q. Can I ask you to turn
15 to page 46, paragraph 113, the paragraph dealing with
16 the concept of free to grow. Can you confirm that the
17 purpose of introducing the concept of free to grow is
18 to encourage FMA holders to regenerate and, therefore,
19 increase their land base and allowable cut?

20 DR. OSBORN: A. The purpose was twofold.
21 That was one of the two purposes, was to have some sort
22 of stimulus, or some sort of indication to the FMA
23 holders of some implications of not regenerating the
24 areas to make them free to grow.

25 Q. So the answer is yes?

1 A. Yes.

2 Q. Thank you. Paragraph 114 of your
3 evidence beginning at the bottom of page 46 and going
4 over to page 47. Your testimony there is that it is
5 important to notice that the adjustment factor - this
6 is really on page 47 - it is important to notice that
7 the adjustment factor is affected very little by
8 introducing the free to grow concept.

9 Would it be fair to say, Dr. Osborn, that
10 the adjustment factor may not change very much but it
11 does not have to in order to have a large effect?

12 A. Sorry, could you repeat the question.
13 There is a piece in the end I am not sure I completely
14 understood.

15 Q. Sure. Would it be fair to say that
16 the adjustment factor would not change very much but it
17 does not have to in order to have a large impact, or I
18 said the first time, large effect?

19 A. Okay. The reason for my hesitancy is
20 it a large effect upon the MAD, a large effect upon
21 what?

22 Q. I think it will become clear when we
23 use an example so why don't we hold off on your
24 response.

25 Would you first of all agree with me that

1 the free to grow is multiplied by the area?

2 A. Free to grow is multiplied by what,
3 sir?

4 Q. By the area.

5 A. Free to grow is an area.

6 Q. Okay. Let me demonstrate this by
7 taking you to page 257 which is Document 55. This is
8 your implications of free to grow in the area base MAD
9 calculation.

10 Just taking the figure of 1.4 under the
11 free to grow age 20 and the 1.6 under the free to grow
12 age 20 on the bottom part of the page, in other words,
13 2B and 2C.

14 A. Understood.

15 Q. If we had 1,000 hectares to work
16 with, if we multiplied the first figure by 1.4 and
17 multiplied the second figure by 1.6, in other words
18 multiplied 1,000 hectares by 1.4 and then 1,000
19 hectares by 1.6, would we not result in a 14 per cent
20 increase?

21 A. I am not sure of whether it is that
22 much increase, but you will certainly get two different
23 answers, one 140 and one 160.

24 Q. Okay. Well, would the mathematics
25 be: 1,000 times 1.4 would give you 1,400 hectares, and

1 1,000 times 1.6 would give you 1,600 hectares and that
2 difference is 200 hectares and the per cent increase
3 difference overall total is one seventh, or 14.3 per
4 cent?

5 Do you accept that mathematics?

6 A. Your arithmetic is correct, yes.

7 Q. So the effect is 14 per cent; is it
8 not?

9 A. On that arithmetic.

10 Q. Yes. Well, I am using your numbers.

11 A. If you turn over to 258 you will see
12 this note applied in that fashion.

13 Q. Well, we are going to come to 258,
14 but would you agree that a 14 per cent increase is a
15 large effect?

16 A. You are talking about shear numbers
17 at this point in time and yes, 140 from 160 is a 14 per
18 cent difference.

19 Q. Thank you. Now, looking at page --
20 excuse me, Document 56 which is page 258, can you
21 confirm for me - now looking at No. 2 on that page -
22 the calculations for No. 2 produce results that are
23 106.9 per cent to 145.6 per cent of the normal area?

24 A. Correct.

25 Q. And, therefore, the variation between

1 the two; that is, between 2B and 2C on that page is
2 approximately 40 per cent, in other words, 145.6 minus
3 106.9 is roughly 40 per cent?

4 A. In percentage basis the comparison
5 might be valid, but is irrelevant but go on.

6 Q. Well, just confirm whether the
7 calculation is correct.

8 A. The arithmetic sounds okay.

9 Q. So 40 per cent. Thank you.

10 Well, has the variability here improved
11 dramatically in comparison to what you describe in
12 paragraph 90 in Document 39 which we discussed
13 yesterday which you referred to in your evidence as
14 producing widely different yield results. You recall
15 that number was 80 per cent.

16 We had that discussion yesterday,
17 paragraph 90, page 40. Paragraph 90, the fifth line,
18 you note:

19 "This will have widely
20 different results for annual yield."

21 And it is a method you indicated the
22 province does not use, but we also confirmed there was
23 a 80 per cent variation.

24 A. Because of the nature of the
25 age-class distribution of the forest.

1 Q. Yes, that's right. Now, in looking
2 at paragraph -- excuse me, looking at Document 56 on
3 page 258, using the calculations that you have advised
4 the Board the Ministry does use, the example that you
5 have used demonstrates a 40 per cent difference; is
6 that right?

7 A. A 40 per cent difference between what
8 and what, please?

9 Q. Comparing -- so 2B and 2C on that
10 page. In other words, comparing the 2C to 2A and
11 the -- or, if you like, the large 1:20 MAD to the
12 normal MAD and then comparing the overmature MAD to the
13 normal MAD you are getting a 40 per cent difference.

14 We just went over this a moment ago and
15 you said yes.

16 A. Between 2A and 2B you are now
17 talking? Between 2A and 2B there is a 40 per cent
18 difference from the normal...

19 Q. No, no. No, no. If we did the
20 mathematics, Dr. Osborn - this is pretty simple you
21 should be able to understand this - 14.6 divided by 10
22 is a 145.6 per cent, all right?

23 In that case we are comparing -- we are
24 simply establishing the relationship between 2B and 2A.
25 In the other case 2C which is the 10.69 to the MAD

1 which is normal MAD which is 10, the arithmetic comes
2 out to 106.9 per cent and it is the 2B to 2C
3 comparison, the variation there is 40 per cent, okay?
4 Are you with me so far?

5 A. Yes.

6 Q. Now, in your testimony yesterday you
7 indicated that in compari -- well, not in comparison,
8 you weren't really talking about paragraph 90 but it is
9 in your evidence. The evidence there indicated that
10 the methods used there would result in an 80 per cent
11 variation which you described in paragraph 90 as
12 showing widely different results for annual yield.
13 Those are your words in paragraph 90.

14 My question is: Are the widely different
15 results in paragraph 90, which is an 80 per cent
16 variation, really that different when we compare what
17 the Ministry actually does when we look at Document 56,
18 where we are getting a 40 per cent variation?

19 Has the variability been improved upon?

20 A. Sir, I had difficulty understanding
21 why 80 per cent difference is the same as 40 per cent
22 difference.

23 Q. Well, would you agree with me that 40
24 per cent is a pretty large variation?

25 A. The indication --

1 Q. Considering it is a method the
2 province does use.

3 A. Yes and the explanation of why that
4 value is in fact between 2A and 2B is 45 per cent
5 different from the norm, was fully explained.

6 Q. Well, my question is: Is the method
7 in Document 56 so much better for the province when the
8 difference is still 40 per cent?

9 A. The method explained in Document 56
10 is most appropriate for the province.

11 Q. So your answer to my question is yes?

12 A. If your question was to do with the
13 40 and the 80 per cent, I cannot understand how those
14 two can possibly be same.

15 Q. Well, they are not the same, but in
16 the one case you say it is wholly -- well, it's not
17 that the 80 per cent example is not used by the
18 province or the example that results in the 80 per cent
19 is something the province does not use.

20 A. Von Mantel's equation, which is what
21 was given in paragraph 90 is not used by the province.

22 Q. And what is used by the province is
23 described in Document 56, which on your example
24 produces a 40 per cent variation which you have already
25 confirmed.

1 A. Between normal and accelerated yes,
2 in that example.

3 Q. All right. And you say that's a good
4 method for the province to use notwithstanding the
5 variation of 40 per cent; is that your testimony?

6 A. Yes, sir.

7 Q. Thank you. Now, can you confirm that
8 the use of free to grow increases the allowable cut?

9 A. It does in some circumstances and it
10 doesn't in others. It depends on the state of the
11 forest.

12 Q. So normally in an overmature forest
13 it would increase the allowable cut?

14 A. It would depend upon how much of the
15 area is free to grow or not in the total.

16 Q. Now, still looking at Document 56
17 which is on page 258, the large 1:20 MAD indicates a
18 result of 10.69 hectares; is that correct?

19 A. Correct.

20 Q. Now, the actual land base used for
21 that was 530 hectares; is that right?

22 A. The area free to grow is.

23 Q. The answer is yes?

24 A. The land base used for the
25 calculation was, yes. But that wasn't the question you

1 asked me. The land base for the calculation is 530
2 hectares.

3 Q. That's what I asked you.

4 THE CHAIRMAN: Okay, look. Let's not
5 bicker back and forth between the two of you.

6 Dr. Osborn, please listen to the
7 questions so that you can respond to the exact question
8 and, Mr. Castrilli, when he gives an answer and he has
9 to qualify it because the question as you are putting
10 it to him, to him doesn't make sense, then we will
11 accept that answer.

12 MR. CASTRILLI: All right, fine.

13 Q. Now, Dr. Osborn, if you calculated a
14 normal area cut on 530 hectares, the MAD would be 6.62
15 hectares; would it not? The mathematics would be 530
16 divided by 80?

17 DR. OSBORN:

18 A. Correct.

19 Q. That calculation does not appear in
20 Document 56; is that correct?

21 A. Correct.

22 Q. Can you confirm for me that 10.69
23 hectares, which is the large 1:20 MAD, is 161.4 per
24 cent of the normal 6.625 hectares and that calculation
25 is found by dividing 10.69 hectares by 6.625 hectares?

1 MR. FREIDIN: Can you run that by us
2 again. I know the witness may be able to keep up, but
3 I am having difficulty keeping up.

4 MR. CASTRILLI: Sure.

5 Q. Can Dr. Osborn confirm for me that
6 the 10.69 hectares, which is the large 1:20 MAD is
7 161.4 per cent of the normal 6.625 hectares? And I
8 have asked him if the calculation for that answer is
9 found by dividing 10.6 hectares by 6.625.

10 DR. OSBORN: A. The arithmetic is
11 correct.

12 Q. Thank you. Can you also confirm for
13 me that if the free to grow is considered not to be in
14 the land base, the use of the MAD calculation produces
15 higher weighting factors?

16 A. Free to grow is in the land base.

17 Q. No, sorry, my question was: If the
18 free to grow is considered not to be in the land base.

19 A. There is no MAD.

20 Q. No MAD. Well, just look at page 258
21 for a moment. Can you confirm for me that the examples
22 on that page show that the free to grow increases the
23 allowable cut for the overmature and large 1:20
24 age-classes from the normal; is that right?

25 A. Those examples do because of the

1 age-class distribution of the forest used in the
2 examples.

3 Q. And when does it not do that when the
4 forest is immature?

5 A. Typically, yes. Again, it depends on
6 the age-class distribution.

7 Q. Will you know or does the Ministry
8 know what percentage of the MAD calculation have been
9 done for immature forests by working group by
10 management unit?

11 A. No. We have to go through every
12 single calculation for every forest unit and every
13 management unit within the province.

14 Q. Now, paragraph 117, page 47. Your
15 testimony there is that a unit forester should review
16 the MAD calculations, the record is there of these
17 reviews. First of all, I am not sure exactly -- I
18 presume you simply mean -- do you mean by review the
19 production of a report?

20 A. No, I use the term the same way as I
21 did in Documents 41, 42, 43 and 44. We went through a
22 review of certain assumptions. And the term review is
23 used in the same concept -- or same context as that
24 that was used in Documents 41, 42, 43 and 44.

25 Q. So this is a mental exercise a unit

1 forester goes through; is that what you mean by review?

2 A. No, not necessarily. He goes
3 through -- or he or she may go through recalculations
4 looking at changing some of those factors.

5 Q. Does the province keep a record of
6 when unit forester reviews would changed MAD
7 calculations?

8 A. Yes. If I understand correctly, in
9 the timber management plan, the various calculations
10 that are performed in looking at the implications of
11 any one result is in fact tabulated and kept in some
12 form of either appendix or separate aggregate of those
13 recalculations or simulations.

14 Q. Sorry, is that done by the unit
15 forester?

16 A. Yes.

17 Q. And would one typically see these
18 attached to -- was it annual reports?

19 A. No, sir. No, they would be
20 management plan.

21 Q. By the plan itself?

22 A. So you have some understanding of
23 what analyses were done to end up with the result that
24 is put into the plan as the final MAD figure.

25 Q. And which panel is going to deal with

1 unit forester reviews?

2 MR. FREIDIN: The final review -- Mr.
3 Castrilli is referring to the different number of
4 calculations that may be done by a forester before
5 actually selecting a maximum allowable depletion for
6 any particular working group, that is part of the
7 planning process and, therefore, will be discussed in
8 Panel 15 when the planning process is described.

9 MR. CASTRILLI: Thank you. And can I
10 presume that we are going to see actual unit forester
11 reviews in that panel?

12 MR. FREIDIN: There will be evidence of
13 actual runs.

14 MR. CASTRILLI: Fine, thank you.

15 Q. Mr. Armson, I understand from your
16 testimony that significant removal of production forest
17 land base for other uses to exclude timber management
18 can also result in deficits between demand and the MAD?

19 MR. ARMSON: A. That is one of the
20 reasons I cited, yes.

21 Q. The FMA reviews that have been
22 produced thus far, however, generally indicate a
23 surplus; don't they?

24 A. I believe that is the case.

25 Q. Is the Board going to see during the

1 course of this hearing examples of where deficits have
2 caused a problem?

3 A. I can't think of an example at this
4 point; that is, for an FMA. I am assuming you are
5 speaking of FMAs now?

6 Q. Yes. Do you have Exhibit 56 before
7 you? It is the Forest Resources of Ontario, 1986,
8 Table 3, page 20.

9 MR. ARMSON: A. Yes, I have that table.

10 Q. Now, looking at that table we have
11 looked at from time to time over the last few days, I
12 don't see any serious or substantial amount of land
13 lost to other uses; do you, in comparison to what is
14 actually part of the timber production land base?

15 A. Well, the table is -- I don't know
16 what you mean by lost. The table is merely a series of
17 numbers relating areas to types of ownership in
18 relation to whether they be production forest.

19 Q. Well, just over the top of the page
20 under Crown, recreation reserves, provincial parks, or
21 those are the three categories.

22 Don't you agree with me that most of the
23 land base there is in fact dedicated to forest
24 production and, in fact, even more so than that table
25 indicates since it has been indicated that reserves are

1 no longer -- or recreation reserves are no longer
2 called that and are, therefore, probably eligible for
3 introduction into the timber production base as well?

4 A. I agree the largest number -- the
5 area of the largest number is in Crown production
6 forest.

7 Q. So why in paragraph 120 do you talk
8 about significant removal of production for forest land
9 base for other uses?

10 A. In paragraph 120 the point was made
11 that there were three factors that could impact, change
12 the supply, one of which was the removal of a part of
13 the production forest land base. It was put there with
14 the other two as three of the factors that could apply,
15 not that necessarily do apply in any instance, but they
16 could apply.

17 Q. So in fact looking at Table 3 there
18 is no significant removal of production forest land
19 base; is there?

20 A. Table 3 does not in any way designate
21 change or loss or addition, it merely is a statement of
22 the numbers in terms of area under different classes of
23 ownership.

24 Q. Well, is there a table that would do
25 and say what in fact you indicate in paragraph 120?

1 A. On provincial basis is I am not aware
2 of such a table.

3 Q. All right. Isn't it also true, Mr.
4 Armson, while we are at it, that you have referred
5 to -- or actually Dr. Osborn has referred to areas of
6 concern that can have modified harvest, operations take
7 place on them; is that right?

8 A. They may or they may have no
9 operations taking place.

10 Q. But isn't it true that even these
11 areas are not lost to the production to the extent in
12 fact operations will take place on them?

13 A. To the extent that operations may not
14 take place, they may be lost to production.

15 Q. Can I take from the converse of that
16 to the extent that operations are taking place on them,
17 they are not lost to production?

18 A. Not totally, that is correct.

19 Q. Now, at paragraph 122, first
20 sentence, you note that utilization of the timber
21 resource is improving. What did you mean, or what were
22 you comparing it to?

23 A. First of all, it was the utilization
24 of species, that the data, the statistics indicate
25 there has been an increase over the years in their use

1 and the specific example I cited I believe was poplar.

2 Q. Now, I also understand from your
3 testimony, Mr. Armson, that one source of Ministry of
4 Natural Resources' data is individual mill demand
5 information; is that correct?

6 A. That is correct. Just for
7 clarification, I believe that is the table in the
8 Timber Management Planning Manual that is filled out
9 and forecast the demand, is that --

10 Q. I am referring to your paragraph
11 125 --no, 125 (a). Now, you indicate that that data
12 under 125(a) is confidential and I believe you noted
13 that in your testimony as well?

14 A. The mill licence returns as such,
15 yes.

16 Q. Can you advise the Board whether the
17 mill demand data used at the confidential data as
18 explained in 125(a) are different from the data used at
19 the timber management plan level that you refer to in
20 paragraph 119 of your evidence?

21 A. Yes, in that the mill licence returns
22 are far more detailed as was explained. The data in
23 the Timber Management Planning Manual is merely the
24 statement of the forecast needs by the licensee.

25 Q. I refer you to Exhibit 7, Table

1 4.18.2 on page 92.

2 A. Yes, I have that table.

3 Q. And the table heading is called:
4 Forecast of Wood Utilization for Prime Licensee or
5 Agreement Holder Mills. And then looking at -- I am
6 just going to read a portion of this page into the
7 record. It advises the person who is responsible for
8 filling out the table to complete the table for company
9 management units and forest management agreement
10 forests.

11 MRS. KOVEN: Would you give me that table
12 number again?

13 MR. CASTRILLI: Sorry, it is Table 4.18.2
14 and right now I am reading from the instructions which
15 appear at page 92 at the top of the page.

16 Q. The instructions note that one is to
17 complete this table for company management units and
18 forest management agreement forests for mill wood
19 utilization that is planned for the five-year term and
20 is to be included in the timber management plan.

21 And if we look at the heading for mills,
22 under Item A from management unit forests:

23 "List prime licensee or agreement holder
24 mills which are forecast to receive wood
25 from this MU/forest. Enter the volume by

1 species that is forecast to be utilized
2 for each mill and sub-total by conifer
3 and hardwood and then enter sub-total for
4 the management unit forest."

5 And then B:

6 "From other sources: For each mill in
7 part A, list following sources from
8 the following named categories:
9 roundwood, chips, mill residues, et
10 cetera."

11 And that is information that is required
12 to be submitted by the FMA holder or the company
13 management unit; is that correct?

14 MR. ARMSON: A. That is correct.

15 Q. And this mill demand data is required
16 to be included in timber management plans; is that
17 correct?

18 A. Yes.

19 Q. Would you agree with me that the data
20 in the timber management plans are neither confidential
21 nor secret?

22 A. That is correct.

23 Q. Your testimony is the data referred
24 to in paragraph 125(a) is different from the data filed
25 in the timber management plan.

1 A. I testified that the mill licence
2 returns which contain other pieces of information are
3 confidential. They may also, in fact do contain
4 similar information to that which may be public in
5 terms of the timber management plan.

6 Q. Sorry, I am not clear on your answer.
7 Is the data in 125(a) different from the data in the
8 timber management plans?

9 A. The data on the mill licence returns
10 as I explained contain data that is confidential. It
11 also contains data that is not confidential.

12 Q. Let me ask you this: To the extent
13 that data is different between what is referred to in
14 125(a) and what is in the timber management plans, what
15 confidence can the public have in the data's validity
16 that appears in the timber management plans?

17 A. The data that appears in Table 4.18.2
18 is a statement of forecast of a mill's perspective or
19 anticipated demands. What confidence can the public
20 have? That is a statement of intention. I cannot
21 judge the public's perception of validity or voracity.

22 Q. Mr. Armson, in 125(a) we are talking
23 about individual mill demand information. It seems to
24 me it is the same information that is required to be
25 filed in the timber management plans.

1 MR. FREIDIN: He has already answered the
2 question he said --

3 MR. CASTRILLI: He said --

4 MR. FREIDIN: He said the information was
5 contained, that some of that information was contained
6 in the Timber Management Planning Manual that was
7 public, but that the mill licence returns contained
8 information that was not public.

9 MR. CASTRILLI: With great respect, Mr.
10 Freidin, 125(a) says: Individual mill demand
11 information. I am not talking about returns.

12 THE CHAIRMAN: But the witness has
13 replied that in the returns, Mr. Castrilli, there may
14 be the same information to an extent that it's
15 contained in the planning document which is public, but
16 it also contains other information which is
17 confidential. And for that reason presumably the
18 return itself is confidential.

19 Is that correct, Mr. Armson?

20 MR. ARMSON: That is correct, Mr.
21 Chairman.

22 MR. MARTEL: Could Mr. Armson tell us
23 what type of information is confidential.

24 MR. ARMSON: If I may, Mr. Martel, in the
25 documents - and I believe they are listed as Document

1 57 in the evidence that was presented -- sorry, on page
2 259 the documents -- there were the series of
3 documents, Document 57a,b,c,d.

4 But just as an example, the information
5 in 57a on page 259 you will notice that it contains
6 production information relating to the mill and that is
7 an example of the type of information that I believe I
8 explained was recognized as confidential.

9 As an example of the information that is
10 derived from the mill licence returns that is not
11 confidential, then Document 57b on the same page would
12 be an example. In other words, it is a statement in
13 this case of wood receipts.

14 Those are statements of fact and that is
15 the kind of information that one would also expect to
16 see in various forms in the timber management plan in
17 terms of past wood receipts.

18 MR. CASTRILLI: Q. Mr. Armson, if I
19 understand your testimony, at page 259 the box headed
20 (e) is not confidential?

21 MR. ARMSON: A. The information in there
22 is a statement of where wood has been received from.
23 That would occur -- I believe there is a table in the
24 Timber Management Planning Manual that identify, for
25 each unit, the mill's past five-year demand, what has

1 been achieved and that would match up presumably with
2 the management unit returns.

3 MR. MARTEL: Then it is possible, using
4 scaling figures, these types of figures to know
5 precisely how much wood is coming out of the forest?

6 MR. ARMSON: That is correct. The amount
7 of wood flowing from each unit and where it goes is
8 known and that information is not obviously
9 confidential.

10 MR. CASTRILLI: Q. Now, Mr. Armson in
11 paragraph 127 you are referring there to the
12 hypothetical deficits or surpluses for the management
13 units that are portrayed in Document 59a which I gather
14 is a -- as I recall, is a computer printout of a
15 hypothetical surplus/demand situation.

16 Now, in practice, would this information
17 be available in Toronto as well as at the district
18 levels -- I guess this is a regional level?

19 MR. ARMSON: A. Yes. This would be
20 information that, with the system in place and with --
21 and I would also emphasize that the units, the plans
22 would have to be in the same format, but this is the
23 information that would be available at both the regions
24 and at main office.

25 Q. So how long has this information been

1 available in this format in Toronto?

2 A. The information in itself -- this was
3 a hypothetical example because, in fact, the system has
4 just been put in place and, as I indicated, the
5 consistency of the information coming from each unit in
6 relation to plans will not be complete until all the
7 units are on the same format.

8 So that there isn't -- in fact, there is
9 information but there is not total consistency in main
10 office at this time with the data.

11 Q. Let me just refer you quickly to
12 Exhibit 4, the Class Environmental Assessment, page 95.
13 Now, you have indicated that the -- I should refer you
14 to the lines, lines 23 to 26, indicate:

15 "In the timber management planning
16 process, however, direction is also
17 provided by objectives and policies
18 derived from higher levels of government
19 planning and decision-making."

20 Now, I gather the policies that are
21 referred to are the three that appear on page 96
22 sustained yield management, forest production policy
23 and integrated resource management?

24 What objectives would be -- or what
25 direction is provided by way of objectives?

1 A. For example, the forest production
2 policy about which the Board will be hearing in Panel 4
3 would be one of those.

4 Q. That is another policy. I said what
5 objectives?

6 A. Well, the objectives are stated in
7 that forest production policy and they will be dealt
8 with in Panel 4.

9 MR. CASTRILLI: Mr. Chairman, could I
10 have one moment's indulgence. I think I may be
11 finished.

12 Q. Let me return you to pages 259 and
13 260, Mr. Armson. Firstly, let me refer you to page
14 259.

15 MR. ARMSON: A. Yes.

16 Q. Could you advise me, for each
17 lettered item -- sorry, at the top left corner it's
18 small (a). Is the information in that for (a)
19 confidential?

20 A. As I indicated, the information in
21 terms of mill production it would be -- and is
22 considered confidential. Just to add to that, the mill
23 licence returns, to the best of my knowledge, are
24 covered by legislation in which they are designated as
25 confidential. I cannot give you the details, but that

1 is my understanding.

2 THE CHAIRMAN: You do not know which
3 legislation that it is covered by?

4 MR. ARMSON: No, I can't sir, at this
5 time.

6 MR. CASTRILLI: Q. And Item (b) again
7 called mill receipts?

8 MR. ARMSON: A. The information in (b)
9 which is taken from the mill licence returns, as I
10 explained, would not be considered as confidential
11 information.

12 THE CHAIRMAN: Mr. Freidin, would it be
13 possible for you to undertake to find out what
14 legislation. I assume it would probably be something
15 like a regulation under the Crown Timber Act or
16 something like that.

17 MR. FREIDIN: I know that the actual
18 mills are identified in the regulation to the Crown
19 Timber Act. I am not sure whether there is a specific
20 section that says they are confidential, but I will
21 look and advise.

22 THE CHAIRMAN: Thank you.

23 MR. CASTRILLI: Q. And then moving on to
24 page 260, Item (c).

25 MR. ARMSON: A. Yes, I see that.

1 Q. I am sorry, is that confidential
2 data -- is data that is referred to in there all
3 confidential?

4 A. That is data that again comes from
5 the mill licence return and on an individual mill basis
6 I believe it is confidential.

7 Q. In the aggregate it would not be?

8 A. In the aggregate it is my
9 understanding - and there are published data on this,
10 so I am quite sure - that in the aggregate, the amount
11 of shavings, the amount of product from regions is, I
12 believe, publicly available, open to the public.

13 Q. And Item (d) on the same page?

14 A. That is a new item that was added, as
15 I explained, in relation to the softwood countervail
16 and the information in terms of changes in employment
17 related to softwood countervail or other causes are
18 posted monthly in a document that I believe is
19 generally available, it isn't a public document and it
20 is published as an item, but it is available throughout
21 the government to various ministries and to other
22 individuals who have asked for it.

23 Q. So generally speaking Item (d)
24 information is not confidential?

25 A. The information in Item (d) per se is

1 not generally available, but changes, mill shutdowns
2 and numbers of employees affected, that information is
3 available on a monthly basis.

4 Q. And which of these four items relate
5 to mill demand information?

6 A. The Item (b) which is a statement of
7 the satisfaction, if you like, of demand which is an
8 identification of wood receipts, would be the one.
9 That is demand that has been met, that is the past
10 demand and those are the measures of volumes of wood
11 that have been achieved.

12 As I explained for the forecast demand,
13 that is in the Timber Management Planning Manual.

14 Q. Forecast demand is in the Timber
15 Management Planning Manual and is not confidential?

16 A. That is correct.

17 Q. And satisfaction of past demand is
18 also not confidential?

19 A. To the best of my knowledge, that is
20 correct.

21 Q. And returning to paragraph 125(a) you
22 say:

23 "Individual mill demand information
24 Consisting of the four tables are
25 confidential."

1 A. The data --

2 Q. Sorry, I am just confused. What mill
3 demand data is confidential?

4 A. The mill licence returns are the
5 confidential data -- at least, they are the
6 confidential documents. Certain of the data that is
7 contained within those mill licence returns is not
8 confidential.

9 MR. CASTRILLI: Mr. Chairman, those are
10 my questions.

11 THE CHAIRMAN: Thank you.

12 Ms. Seaborn, are you ready to proceed at
13 this time?

14 MS. SEABORN: Yes, Mr. Chairman.

15 I am wondering if you wish to take a
16 break for a few minutes while Mr. Castrilli and I
17 can switch places or if you just want to wait a couple
18 of minutes --

19 THE CHAIRMAN: Perhaps we will do it in
20 that fashion. We will take the mid-morning break now
21 and then commence your cross-examination immediately
22 thereafter until lunchtime.

23 MS. SEABORN: I think, Mr. Chairman, just
24 so Mr. Freidin knows, given that Mr. Castrilli has
25 finished earlier than anticipated, after the break I

1 could be done by lunch or shortly after the lunch
2 break.

3 THE CHAIRMAN: How about you, Mr.
4 Freidin, how long do you think you will be?

5 MR. FREIDIN: I don't think I will be
6 very long, maybe an hour, less than an hour. I would
7 like to reserve my decision as to whether I want to do
8 the re-examination, before the Board, before morning.

9 It may be that I can get enough done over
10 the lunch hour to do it this afternoon, but...

11 THE CHAIRMAN: So you may not be in a
12 position to commence this afternoon, is that what you
13 are saying?

14 MR. FREIDIN: That is correct.

15 THE CHAIRMAN: Now, in the event that you
16 were not able to commence this afternoon, what about
17 this orientation session; could that be run this
18 afternoon?

19 MR. FREIDIN: I understand that there are
20 details still being discussed with Mr. Mander and that
21 that presentation wouldn't be ready until this
22 afternoon for tomorrow.

23 THE CHAIRMAN: So we may have some dead
24 time there after noon; is that right?

25 MR. FREIDIN: Well, you may have some

1 dead time, Mr. Chairman, but I won't.

2 THE CHAIRMAN: Okay. Let's sort it out
3 after lunch.

4 Thank you.

5 --Recess at 10:35 a.m.

6 ---Upon resuming at 11:00 a.m.

7 THE CHAIRMAN: Thank you, ladies and
8 gentlemen. Please be seated.

9 I think it is fair to announce to everyone
10 that the Board, and I suggest some others have probably
11 done the same -- we have changed our reservations for
12 leaving til tomorrow from Thursday. So it would be our
13 intention to leave tomorrow afternoon on the regular
14 flights out.

15 So I am hoping that the Ministry can
16 schedule this orientation, based on the fact that it is
17 not our intention at this time - consideration of the
18 length of time the cross-examinations have taken - to
19 stay here Thursday.

20 MR. FREIDIN: I think it is wise.

21 THE CHAIRMAN: Ms. Seaborn?

22 MS. SEABORN: Thank you, Mr. Chairman.

23 CROSS-EXAMINATION BY MS. SEABORN:

24 Q. Dr. Osborn, I would like to deal
25 first with the topic of the classification of the

1 productive forest. As I understand MNR's evidence,
2 that portion of the productive forest that is labeled
3 as site class 4 and islands less than 40 hectares is
4 called protection forest; is that correct?

5 DR. OSBORN: A. Correct.

6 Q. And the classification of trees as
7 site class 4 is a height over age relationship; is that
8 correct?

9 A. Correct.

10 Q. When we discussed the forest stand
11 maps you identified where one could determine the site
12 class of a working group by looking either for an X or
13 and a number; is that correct?

14 A. That's correct, yes.

15 Q. And if I looked at a stand map and
16 saw the number 4, would I then know that that area is
17 protection forest?

18 A. Yes. You would see also on the
19 forest stand the label PF in front of the forest stand
20 description.

21 Q. Thank you. Would you agree with me,
22 Dr. Osborn, that although protection forests are
23 capable of growing commercial timber, doing so would be
24 detrimental to the environment and, accordingly,
25 protection forests are managed primarily to exert a

1 beneficial influence on soils, water and the overall
2 landscape?

3 A. The first statement, the answer is
4 not necessarily true. We inferred that the reasons for
5 being site class 4 height and age are typically one of
6 two forms; either the site is inherently -- well, the
7 site is of low productivity, hence a low height for a
8 given age for that species, or the tree, the actual
9 species on that site isn't ideally suited to that site.

10 And we speak of off-site species whereby,
11 for example, you make a poplar or aspen who has grown
12 on that site as a pioneer species is in there first;
13 because it is not the ideal site, although it has got
14 there first it has grown, but it has not grown very
15 well.

16 Now, that site may or may not be
17 perfectly suitable for other species.

18 Q. Well, I understand your evidence to
19 the extent that you discussed a change in working group
20 on these sites that are labeled as protection forest as
21 being one way of dealing with them, you go in and look
22 at them and decide that perhaps there is the wrong kind
23 of timber growing on that site, and you may want to
24 change your working group; correct?

25 A. That is certainly an option that you

1 look at and review, yes.

2 Q. But in terms of what we normally find
3 on the protection forest when you go and look at those
4 lands, wouldn't you agree with me that these are
5 generally areas where you would be managing them
6 primarily to exert this beneficial influence on soils
7 and the landscape?

8 A. You would certainly pay attention to
9 that, but you would also pay attention to that with all
10 due respect on all the other site classes as well.

11 Q. Well, just turn for a moment to the
12 Forest Resources of Ontario, 1986, which is Exhibit 56.
13 And if you could look at page 17, and in the third full
14 paragraph on page 17--

15 A. Okay.

16 Q. --halfway down in the third paragraph
17 the definition that you have given us for protection
18 forests in terms of site classes included. And I am
19 reading about the tenth line down:

20 "Protection forests are either lands with
21 poor timber growing capability or
22 islands less than 40 hectares in size."

23 Do you see that?

24 A. Correct.

25 Q. And then further down it says:

1 "Although these forests are capable of
2 growing commercial timber, doing so would
3 be detrimental to the environment.
4 Therefore, they are managed primarily to
5 exert a beneficial influence on soils,
6 waters and the overall landscape."

7 Correct?

8 A. That's what the statement says.

9 Q. And is it not true then that
10 protection forest areas do tend to show those sorts of
11 qualities where you have a landscape that is probably
12 not as good for growing commercial timber as the other
13 site classes, for example?

14 A. Given it is the right species on the
15 site - right in the sense of the tree on that site is
16 growing at site class 4 - it exhibits poor growth and,
17 therefore, for commercial tree growth is not fast
18 enough, yes.

19 MR. MARTEL: Can I ask a question?

20 DR. OSBORN: Yes.

21 MR. MARTEL: If the timber is even right
22 but the soils are bad, in the long run, and the
23 difficulty of getting regeneration would take -- let's
24 say 120 years instead of 80 years, would you consider
25 cutting that timber then?

1 DR. OSBORN: The reason I hesitate is
2 that it is both a yes -- unfortunately a yes and no
3 answer.

4 If I only had those kinds of sites and I
5 could live with 120-year rotation and that was the way
6 of doing business, where I could afford to live with a
7 120-year rotation, that is a possibility. That's
8 really why I hesitate.

9 Typically, if I have got a choice as in a
10 timber management sense, I won't go looking for
11 operations on site class 4, I would far sooner
12 concentrate my time and effort on those sites that have
13 indicated higher productivity.

14 So typically as a manager I will not look
15 for those deliberately, I will be looking for the
16 better areas. However, given the situation I am in, I
17 may look at site class 4 for some operations.

18 MR. MARTEL: But the priority continually
19 remains to be timber production as opposed to, let's
20 say, conservation or protecting the environment?

21 DR. OSBORN: In this undertaking, as I
22 understand it, timber production is the purpose of the
23 undertaking with the caveats that we have been through
24 before, that we don't do that without consideration for
25 other uses of the forest and the other issues that Ms.

1 Seaborn referred to.

2 MS. SEABORN: Q. Dr. Osborn, perhaps you
3 can turn to the Timber Management Planning Manual for
4 me which is Exhibit 7 at page 173. We have the
5 definition section. Do you have that in front of you?

6 DR. OSBORN: A. Yes.

7 Q. And you will see about halfway down
8 the page on 173 again we have a definition of
9 protection forest.

10 "All productive forest land managed
11 primarily to exert beneficial influence
12 on soil, water, landscaped or for any
13 other purpose when production of
14 merchantable timber, if any, is
15 incidental."

16 Now, it seems to me in reading that
17 definition and looking at the definition that is
18 contained in the Forest Resources of Ontario, both
19 these definitions are consistent with one another?

20 DR. OSBORN: A. Yes, and they are
21 consistent, as that page 173 infers, with the
22 definition that was in the FRI manual that is given on
23 page 159 of the evidence, and when we describe this we
24 referred to Exhibit 79.

25 Exhibit 79 was a letter -- Exhibit 79 was

1 a letter that was sent on May the 3rd, 1988 that spoke
2 to this subject and spoke to this definition. And,
3 again, without going back into that exhibit, I went
4 through this particular piece of evidence to explain
5 that that set of words in the definitions have given
6 rise to some misunderstandings with how the FRI data
7 were put together.

8 And, therefore, we have -- that's why I
9 was so careful to explain the FRI, how we have put
10 those data together in the FRI with no inference in the
11 FRI as to how the areas are managed.

12 And we went, again, into Exhibit 79
13 because that contains in the back of it some inferences
14 about forest management, except Exhibit 79 was to be a
15 replacement set of pages for words in the Environmental
16 Assessment Document, Exhibit 4.

17 Q. Well, I understand that that's your
18 position and that's your evidence, that you have
19 amended the Environmental Assessment with respect to
20 the definition of protection forest insofar as making
21 it clear that protection forests are those working
22 groups that fall within site class 4 for the purposes
23 of photointerpretation and for the purposes of the FRI.

24 But the point I am getting at is, that if
25 you look at the definition of protection forests that

1 you had formally in the EA, it exists in the Forest
2 Resources of Ontario, which is a 1986 document, and
3 which also exists consistently in the Timber Management
4 Planning Manual.

5 All those definitions point out that the
6 type of land we are looking at for protection forests
7 are those areas that should be managed primarily to
8 exert beneficial influence on soil, water, landscape,
9 et cetera.

10 A. And I don't disagree with that as a
11 managerial thought--

12 Q. Okay.

13 A. --along those lines.

14 Q. That's fine, thank you.

15 Now, from your earlier testimony and from
16 looking at Exhibit 79, which is the amendment to the
17 Environmental Assessment, I understand there are two
18 main reasons why trees may have a poor height over age
19 relationship and be classified as site class 4, and
20 those two reasons you gave were poor growth due to
21 shallow or wet soils, or that the working group was
22 inappropriate for the soils.

23 Is that a correct summary?

24 A. Yes.

25 Q. And, as I understand the evidence, if

1 a field inspection determines that a change in working
2 group is required, you would have that option?

3 A. Yes.

4 Q. And would you agree that if a field
5 inspection determines that the reason for poor growth
6 is shallow or wet soils, timber management activities
7 including harvest should not occur in those areas?

8 A. It is the local management decision
9 to make and I, sitting where I sit, can pass no comment
10 on that.

11 Q. So is it your evidence then that
12 whether or not timber management activities would take
13 place in areas where there is poor growth is a
14 management unit -- management level decision made by
15 the unit forester?

16 A. Very much so, site-by-site.

17 Q. And are there any guidelines or
18 district procedural directives that would help the unit
19 forester in making the decision as to whether to permit
20 timber management activities in those areas?

21 A. I am not certain of the answer to
22 that, but one place where one would turn as a
23 professional would be the silvicultural guidelines that
24 would exist for the different species, and you could
25 see within those what the inferences of management of

1 that species was.

2 That is, as a professional, where I would
3 start to look. Now, I don't work at the district level
4 so I am not sure of the exact documents to hand.

5 MS. SEABORN: It this topic perhaps - Mr.
6 Freidin can assist - going to be addressed by another
7 panel with respect to activities in the protection
8 forest?

9 MR. FREIDIN: Panel 15.

10 MS. SEABORN: Is this something that we
11 might also be looking at in the harvest panel as well,
12 Mr. Freidin?

13 MR. FREIDIN: No. That panel -- we are
14 going to try to keep that panel to describe the actual
15 activities and how they are actually carried out and
16 what the potential effects are.

17 They won't be making any general
18 indication of how managerial decisions might be made
19 about operating on a site class 4.

20 MR. ARMSON: If I might, Mr. Chairman, I
21 believe I will be discussing some of the elements here
22 in Panel 9 which is dealing with some of the principles
23 in silviculture as they relate to the forest.

24 I believe, Ms. Seaborn, some of the
25 elements will be touched there. Not on a district

1 day-by-day basis, but the principles that are involved.

2 MS. SEABORN: Q. Thank you, Mr. Armson.

3 Dr. Osborn, are all the areas harvested
4 included in the MAD calculation?

5 DR. OSBORN: A. Not necessarily.

6 Q. Why not?

7 A. Because some of the -- okay. Because
8 some of the areas harvested may be on site class 4 or
9 on areas non-free to grow.

10 Q. So you are saying that if areas are
11 harvested that are within site class 4 that would not
12 be included in the MAD calculation?

13 A. Correct.

14 Q. Now, when you harvest then in site
15 class 4 or protection forest for the purposes of stand
16 conversion, changing working group, then the area
17 harvested would be included -- sorry, will not be
18 included in the MAD calculation?

19 A. The area harvested will, at the time
20 it is harvested, not be in a MAD calculation.

21 Q. Will it ever appear in the MAD
22 calculation?

23 A. I hesitated because that's where I
24 thought you were going to go.

25 If and when that area is "regenerated"

1 and proven free to grow, at that time that area will
2 enter into the base for the MAD calculation for the
3 working group that it would enter into given the trees
4 on the site.

5 So if it is regenerated, the trees
6 eventually reach a stage or status of free to grow in
7 whatever species they are, to go into whatever working
8 group, at that point in time in the calculation, that
9 area then is enfolded back into the base for the MAD
10 calculation for the ensuing period.

11 Q. Well, if it is not included in the
12 MAD calculation in the first instance, then isn't the
13 area harvested greater than the MAD calculation?

14 A. If that takes place and if the entire
15 MAD is depleted, yes, arithmetically.

16 Q. Dr. Osborn, can you advise me how
17 many hectares of protection forest were harvested in
18 1987 in an effort to change working groups?

19 A. No, I can't.

20 Q. Can that information be obtained?

21 A. If you went back to each and every
22 management unit, each and every forest unit and you got
23 the individual forest stand maps out, the cutover
24 mapping that was described earlier, you could go
25 through and tally all the stands and ascertain which

1 ones that were harvested were actually protection
2 forest, and you would also need to know which of those
3 stands was the planned intention of conversion.

4 Q. I am wondering if the Ministry could
5 provide us with that information where we would just
6 like to see it for one year for some comparative
7 purposes?

8 A. Just to make sure I completely
9 understand, for all the management units in the
10 province?

11 Q. For the management units within the
12 area of the undertaking. We would like to have some
13 idea of how many hectares of protection forest were
14 harvested in an effort to change working groups.

15 A. Okay. The first half of the
16 statement technically is possible in the sense of going
17 back to every single forest stand map to find that
18 answer.

19 The second half of the statement of
20 whether that particular stand was intended to be
21 converted, now you are into a stand-by-stand
22 prescription and I am not sure whether that sort of
23 thing exists stand-by-stand.

24 Q. Well --

25 A. It may do for an aggregate, but I am

1 not sure stand-by-stand.

2 And just, if I continue for a moment, we
3 will typically harvest not a stand but a block of
4 stands. Now, if I was to go to the extreme southwest
5 corner of Exhibit 85, there are a block of stands, four
6 or five, one of which is protection forest. That stand
7 may have been agreed to be harvested and the whole
8 block, the intent may well be to regenerate to working
9 group XYZ.

10 So that individual stand doesn't have an
11 individual stand prescription per se, so you would have
12 to go back and ascertain where was that stand in
13 relation to the surrounding stands, what was the
14 managerial intent for that block of stands.

15 All of that which you ask is possible, it
16 just happens to be very laborious.

17 MS. SEABORN: Well, I am not asking for
18 projections though. What I am looking for, Mr.
19 Chairman, is an indication for a one-year period of
20 what actually happened in the protection forest and the
21 evidence has been that timber management activities
22 take place in the protection forest, so this is
23 obviously an issue that is of some concern to my
24 client.

25 And, in particular, we are not so much

1 concerned - just so the Board understands where we are
2 going with this - with timber management activities
3 that take place for the purpose of changing working
4 groups, but it is our information that activities in a
5 protection forest related to changing working groups is
6 not really a large percentage of the activities that do
7 take place in the protection forest.

8 So we would like to have a look, just for
9 one year, at what has happened in the protection
10 forest.

11 THE CHAIRMAN: But you will also have to
12 have the figures to show how much was harvested in the
13 protection forest overall, whether or not they were for
14 the purpose of changing working group, in order to make
15 that comparison; would you not?

16 MS. SEABORN: That would be helpful, yes.

17 MRS. KOVEN: Or you don't care if it is
18 commercial harvesting or regeneration activity?

19 MS. SEABORN: That's correct, we don't
20 need that provision.

21 MR. FREIDIN: I don't profess to know all
22 the details, but it is my information that the request
23 which is being made is not only laborious, as indicated
24 by Dr. Osborn, but you know, it is that.

25 I am not too sure whether the

1 information -- I don't know the practicalities. Can I
2 take it under advisement.

3 MRS. KOVEN: We might look at an area in
4 the undertaking that has a larger proportion of
5 protection forests, rather than the entire area, is it
6 possible, a way of putting a boundon it?

7 MR. FREIDIN: That's the sort of thing I
8 want to discuss with my client.

9 MS. SEABORN: Well, alternatively, Mr.
10 Chairman, we would be content if we could just see the
11 activities that took place within site class 4, and I
12 think we have established that looking at the stand
13 maps you can determine quite easily where site class 4.

14 And I would think on a management unit
15 basis the Ministry would be able to obtain from the
16 unit foresters for the management units what happened
17 on site class 4 for a one-year period.

18 THE CHAIRMAN: But if you want a
19 representation, would you need the whole area of the
20 undertaking?

21 Could you not pick one management or
22 district area to give you that representation, one in
23 which there are a number of protection forests and then
24 utilize that as the information for which you want to
25 make any kind of comparison?

1 That's not to say it would be accurate
2 for the whole of the area of the undertaking, but it
3 would give you that kind of broad, generic information
4 for which you could derive your conclusion that to
5 change for working class, you know, represents a small
6 percentage.

7 MS. SEABORN: As long as it was a large
8 enough area that, for statistical purposes, would be
9 useful to us and the Board.

10 THE CHAIRMAN: All right. Mr. Freidin,
11 would you consult with your clients and find out if
12 there is an area that has a number of protection
13 forests and would represent a large enough sample to be
14 of some use statistically, rather than the whole of the
15 undertaking?

16 MR. FREIDIN: I will discuss that with my
17 client and get back to you.

18 MS. SEABORN: Thank you.

19 THE CHAIRMAN: And at the same time,
20 would you also in that consultation indicate what types
21 of problems you would run into to do it for the whole
22 of the area of the undertaking so that we have for
23 comparison purposes, in terms of the work required by
24 you, what those two scenarios are?

25 MR. FREIDIN: Yes, sir.

1 THE CHAIRMAN: Thank you.

2 MS. SEABORN: Thank you.

3 Q. Dr. Osborn, are OPCs mandatory prior
4 to harvest operations in site class 4?

5 DR. OSBORN: A. No.

6 Q. And you would agree with me then that
7 in stands of timber that are site class 4 it would be a
8 discretionary call by the unit forester as to whether
9 or not an OPC is carried out?

10 A. Yes.

11 Q. We have been discussing protection
12 forest and the second category of the productive forest
13 is the production forest, and, as I understand the
14 evidence, productive forest lands of site class X, 1, 2
15 and 3 are collectively categorized as production
16 forest?

17 A. Correct.

18 Q. And then within production forest we
19 have the classifications production forest regular and
20 production forest reserve?

21 A. Correct.

22 Q. And production forest reserves are
23 those areas which have significant silvicultural and
24 forest management impediments; these may be extremely
25 rocky soils, steep slopes or shallow soils?

1 A. As looked at and as seen by the
2 photointerpreter.

3 Q. Yes. And these areas were formerly
4 called protection forest reserves?

5 A. Correct.

6 Q. Looking again at the Forest Resources
7 Inventory of Ontario, Exhibit 56, page 17. If you look
8 at the fourth paragraph on that page a figure is given
9 for the land base for production forest reserves as
10 being 2.4-million hectares; correct?

11 A. That's what it says on page 17.

12 Q. And above that in paragraph 3 we are
13 given a figure of 2.1-million hectares for protection
14 forest; correct?

15 A. Correct.

16 Q. Dr. Osborn, do you recall Mr.
17 Armson's evidence during Panel 2 when we were
18 discussing his 1976 report, were you here for that
19 evidence?

20 A. Are you talking about the table that
21 Dr. Armson had given to him from the Ministry in 1976--

22 Q. That's right.

23 A. --to do with estimates of what the
24 land base may be in the year 2020?

25 Q. That's correct.

1 A. Yes.

2 Q. And at that time Mr. Armson advised
3 us during Panel 2 that he accepted the definition of
4 protection forest as being fragile sites, site class 3
5 considered too poor for timber production and other.

6 MS. SEABORN: I am referring Mr. Chairman,
7 to page 175 of the Panel 2 evidence which is Exhibit
8 53.

9 Q. And, Dr. Osborn, my question was:
10 Mr. Armson in his evidence in Panel 2 agreed with me
11 that the accepted definition of protection forest in
12 1976 was the total of fragile sites, the portion of
13 site class 3 considered too poor for timber production
14 and other, whatever that means, and I think we agreed
15 that neither of us knew what other meant.

16 Are you aware of that testimony?

17 A. Yes.

18 Q. Now, I just wanted to look quickly at
19 the numbers on page 170, and I think the most efficient
20 way to do that would be for us to look at Mr.
21 Castrilli's interrogatory which is Exhibit 121, because
22 there is a conversion in that interrogatory answer
23 provided by MNR into hectares.

24 Do you have that interrogatory in front
25 of you?

1 A. Yes.

2 Q. Under MNR's response to the
3 Interrogatory No. 3, some conversions were made from
4 Mr. Armson's report from acres to hectares. So for
5 parks and park reserves we have approximately
6 4.2-million hectares; correct?

7 A. That's what it says in Exhibit 121.

8 Q. Now, leaving aside parks for the
9 moment, if you add up the next three items under that
10 Answer No. 3, portions of site class 3, fragile sites
11 and other, you get to an approximation of 6.6-million
12 hectares.

13 Would you agree with that math?

14 A. Yes.

15 Q. It wasn't too complicated. And so if
16 we look at Mr. Armson's report in 1976 and the figures
17 that he used from MNR, the total deductions for
18 protection forest in hectares would be 6.6-million;
19 correct?

20 A. Yes.

21 Q. Now, could you explain why it is that
22 in the Forest Resources of Ontario, 1986, we are given
23 a figure of 2.1-million hectares for protection forest,
24 whereas 10 years earlier in 1976 there existed
25 6.6-million hectares of protection forest?

1 A. I have been through this before in
2 cross-examination when this exhibit was introduced by
3 Mr. Castrilli. The answer still remains the same.

4 The figure that was given to Mr. Armson
5 in 1976 was an estimate at that point in time within
6 MNR of what might be the area in that category by the
7 year 2020. It was not a statement of what existed
8 actually in 1976, it was a statement in '76 of what was
9 the estimated projection for those categories of land,
10 however so defined, by the year 2020, which is what
11 Exhibit 121 states.

12 Q. I recall that evidence and I accept
13 that explanation with respect to parks and park
14 reserves because I understand that you could do
15 projections and say: In 2020 we think so many hectares
16 will would be removed for parks.

17 But when we are looking at site class 3,
18 fragile sites and other, are we not dealing with items
19 that are defined by physical paramaters?

20 A. Partially.

21 Q. So if these three things existed in
22 '76 they are going to exist now?

23 A. We could go back to '76 with
24 difficulty and recompile all the data actually in the
25 FRI in 1976 to produce a table of what did we actually

1 have in 1976.

2 Now, such a compilation would be somewhat
3 painful, but that would produce numbers that actually
4 showed what we had in categories similar to those
5 listed on page 175 of the evidence of Panel 2.

6 Again, with reference to page 175,
7 fragile sites: Even though I was in the Ministry at
8 that time and partly associated with these data, I have
9 no recollection of exactly what the word fragile site
10 meant.

11 I also have no understanding of 175 under
12 Item B of what portion of site class 3 was alluded to
13 to give rise to the figure on page 175 of 8.5-million
14 acres. I don't know whether it was half, a quarter, 75
15 per cent, I do not know, and I go back in the Ministry
16 a long time in terms of -- I also am not aware, much as
17 you discussed with Mr. Armson, what went into other.

18 So what those speculations were,
19 estimates were back in 75-76, unfortunately I do not
20 know, but there still were estimates of what might be
21 the situation by the year 2020.

22 Q. Well, how could you estimate -- I am
23 having trouble with understanding the concept of how
24 you could estimate a fragile site, this is physical
25 parameters, the fragile site, if it was there in the

1 70s it is going to be there today.

2 A. Okay. The FRI per se does not
3 identify fragile sites. Right now - and we have been
4 through this - there is no easily defineable parameter
5 at the moment of what is a fragile site. There is no
6 provincial overall inventory of what is a fragile site.

7 Locally, there are local guidelines and
8 local inspections, and evidence has been discussed by
9 Mr. Armson about some systems that lend itself towards
10 them, but at this point in time, the FRI certainly does
11 not have a category of fragile sites.

12 Q. But, Dr. Osborn, I mean in '76 in Mr.
13 Armson's report he talked about deductions for
14 protection forest and included fragile sites. We had
15 the FRI then, I assume we are talking about site class
16 4.

17 A. Well, your assumption may or may not
18 be valid. All I am saying is the FRI 1976 did not have
19 any category in it that was called fragile sites.

20 Q. I am sorry, the...?

21 A. The FRI in 1976 did not have any
22 category in it that said fragile sites.

23 Q. Well, it had a category called
24 protection forest; right?

25 A. Correct.

1 Q. And protection forest is defined as
2 including fragile sites?

3 A. No, protection forest is including
4 sites with a height over age value to give a site class
5 4. Without worrying about going back into what the
6 words say, that is how it was done in 1976, it was a
7 height over age relationship.

8 Q. Well, Mr. Armson's evidence in Panel
9 2 was that he accepted the definition of protection
10 forest that MNR had given him through the forest
11 production policy options as including fragile sites in
12 that portion of site class 3 considered too poor for
13 timber production.

14 And if we look at the transcript from the
15 questions I asked Mr. Armson during Panel 2, and I am
16 referring to page 2971 of the transcript, my question
17 was:

18 "Would you agree with me that the items
19 under deductions for protection forest
20 would be areas that would be able to be
21 defined by physical parameters, whereas
22 if we look at deductions for parks, park
23 reserves, proposed wilderness, those
24 would be areas where you were looking at
25 projections?"

1 And Mr. Armson responded:

2 "Well, you were looking at a different
3 set of criteria for parks than you would
4 be -- I agree with your first statement
5 that presumably the way in which you
6 arrive at that number and whether it was
7 fragile would be based on some objective
8 criteria. I agree with that."

9 That was Mr. Armson's evidence during
10 Panel 2 with respect to the difference between
11 estimates for parks and looking at the items that have
12 been listed for protection forest.

13 Do you disagree with that?

14 A. I wouldn't have worded it exactly the
15 same way. If I heard - Mr. Armson should really speak
16 to this - if I heard correctly, Mr. Armson inferred
17 that those definition of fragile sites could be from
18 objective parameters, could be.

19 What I am saying is in 1976 in the FRI,
20 objective parameters or not, the FRI did not have a
21 category for fragile sites.

22 Q. Well, let's just look at one more
23 quick calculation and then I will leave this point. If
24 you look at -- on Exhibit 121, the amount in hectares
25 for fragile sites, we have got 2.4.

1 A. Yes.

2 Q. And we agreed that according to the
3 Forest Resources of Ontario, 1986, the number of
4 hectares for protection forest was 2.1-million;
5 correct?

6 A. That's correct.

7 Q. Now, would you not agree with me that
8 if I look at that 2.4 and 2.1 there is a correlation
9 there between fragile sites and protection forest?

10 A. I would agree the two numbers are
11 close, but there is no inference at all that one
12 translates into the other.

13 Q. Okay. But you would agree that the
14 numbers are close?

15 A. Yes. I would agree, yes.

16 Q. Okay. Now, would you agree with me
17 that what is now called production forest reserve was
18 included in the 1976 definition of protection forest?

19 A. In 1976, those areas were labeled
20 protection forest reserve.

21 Q. That's right. And would you agree
22 with me that what is now the production forest reserve
23 was included as part of the definition of protection
24 forest?

25 A. Yes, and the reason it was changed

1 was because of the complications and misunderstandings
2 that arise out of placing it in that category back in
3 1975.

4 Q. And if we look at your Panel 3
5 evidence at page 158 --

6 MS. SEABORN: And this, Mr. Chairman, is
7 the document entitled Forest Inventory Procedure for
8 Ontario that has been referred to as the manual.

9 Q. Do you have that page in front of
10 you?

11 DR. OSBORN: A. Yes.

12 Q. And as I understand some earlier
13 testimony, this document hasn't been revised; has it,
14 since 1978?

15 A. It hasn't been, no. You asked in an
16 interrogatory and the manual has not been revised since
17 that time in written form.

18 Q. And at the top left we have
19 another -- top left-hand side of 158 you have the words
20 protection forest in italics and we have another
21 definition of protection forest.

22 "...managed primarily to exert beneficial
23 influence on soil, water, landscaped or
24 for any other purpose when the production
25 of merchantable timber, if any, is

1 incidental."

2 Correct?

3 A. That is what it says on 158.

4 Q. And that definition is almost
5 identical to the definition that we looked at earlier
6 in the Timber Management Planning Manual; correct?

7 A. I agree.

8 Q. And on page 158 there is a footnote
9 No. 1 beside protection forest, and on the bottom
10 right-hand corner of page 158 we have the category
11 called protection forest reserve which, as you advised
12 me earlier, has been changed now to production forest
13 reserve?

14 A. Correct.

15 Q. And according to the 1987 procedures,
16 "Protection forest reserve, PFR, is used
17 when the stand parameters do not fall
18 within the limits of site class 4. This
19 eliminates manipulation of the height/age
20 figures in order to meet the criteria."

21 Now, would you agree with me that
22 according to the Forest Inventory Procedure in 1978,
23 protection forest reserve was considered to be a subset
24 of protection forest?

25 A. As the name implies, agreed.

1 Q. Now, would you agree with me, Dr.
2 Osborn, that whether an area is classified through the
3 FRI as protection forest or production forest reserve,
4 if there are shallow soils over bedrock or extremely
5 rocky soils, deep slopes, that harvesting activities
6 should be prohibited?

7 A. Not necessarily.

8 Q. Would you agree that operations
9 should be modified in those areas?

10 A. Okay. I am not a local field
11 forester, however I would want to carefully consider
12 site-by-site and I would want to seriously consider
13 what were the implications and likely impacts of both
14 the harvesting operation and/or the regeneration
15 operation.

16 And it was for those concerns that the
17 FRI deliberately flagged those sites that in the eyes
18 of the photointerpreter gave raise -- in the eyes of
19 the photointerpreter who are forest technicians to put
20 a flag up to help the local field forester look at
21 areas that already should have been and should be
22 looked at to see what management activities should take
23 place.

24 It was a flag from an early day as to
25 look at these sites and think what the implications of

1 operations may be. It was the flag simply.

2 Q. And I take it, whether or not there
3 would be activities within the protection forest or the
4 production forest reserve that, again, would be
5 determined on a management unit level?

6 A. Absolutely.

7 Q. And the degree of those operations
8 could differ very much from management unit to
9 management unit?

10 A. There I will step back a little bit
11 because I am not sure exactly what is in the guidelines
12 we earlier discussed as to whether there was, I will
13 use the word, free hand for anybody or whether in fact
14 there are some guidelines indicating, I will use the
15 word, restrictions to the free hand.

16 And I am not sure of the operational
17 details and, therefore, I am not sure of the answer to
18 your question whether there will be incredible
19 variation or not.

20 Q. Well, is it MNR's position with
21 respect to these two areas, protection forest and
22 production forest reserve that standard guidelines are
23 to be followed by the unit forester?

24 A. Here I don't know whether there will
25 or will not be or there are or there are not "standard

1 guidelines" speaking to FRI categories. I cannot
2 comment as to whether there are or there will be.

3 Q. And I understand from Mr. Freidin's
4 comments that this is one area that will be dealt with
5 in Panel 15.

6 MS. SEABORN: But I will just tell you,
7 Mr. Chairman, what my concern is: That when we are
8 looking at the Timber Management Planning Manual in
9 Panel 15 and we are looking at sensitive areas, it is
10 my understanding that we are going to be dealing
11 essentially with the integration of resources among
12 timber versus non-timber values, and what I am getting
13 at here is some sort of indication and wanting to know
14 from the Ministry an understanding of what standards
15 are applied when we are just dealing with timber
16 values, you are not even into the area of non-timber
17 values yet.

18 We are looking at environmentally
19 sensitive areas and how the unit foresters are going to
20 deal with those areas, if they are going to deal with
21 those areas in a standardized way. And if those issues
22 are going to be addressed in Panel 15 as well, then I
23 am content to wait, and perhaps whatever comes up in
24 Panel 9, as Mr. Armson said, with respect to
25 silvicultural practises in the forest.

1 MR. FREIDIN: Yes. Leaving aside any
2 agreement or disagreement with the reference to these
3 areas as sensitive sites, the operations -- whether
4 operations are going to take place on those lands will
5 be dealt with in Panel 15.

6 I think, as indicated by Mr. Armson, in a
7 general way in Panel 9.

8 MS. SEABORN: Q. And, Dr. Osborn, OPCs
9 are not mandatory, are they, for production forest
10 reserve areas?

11 DR. OSBORN: A. OPCs are not mandatory.

12 Q. So, again, whether or not an OPC
13 takes place on a production forest reserve area would
14 be a decision made by the unit forester?

15 A. Absolutely.

16 Q. And on FMAs, the decision about
17 whether or not to carry out an OPC in an area that is a
18 production forest reserve would be the decision of the
19 company forester?

20 A. As I understand it, and I think the
21 details for that are specified in the FMA ground rules.

22 Q. I think we looked at this earlier in
23 the Timber Management Planning Manual, page 196,
24 Exhibit 7. And on page 196 under 4.1, Operational
25 Surveys, it says:

1 "An operational survey may be done before
2 the plan is submitted."

3 A. Correct.

4 Q. So it is a decision, on FMAs it is
5 going to be a company decision about whether or not we
6 are going to see an OPC?

7 A. The reason I hesitate is I am not
8 sure it is a completely unilateral decision. I am not
9 sure whether or not anybody other than the company has
10 any say in that or not. I am not certain.

11 Q. Now, with respect to your Exhibit 79,
12 which was the amendment to the Environmental
13 Assessment, turn to page 4 of that exhibit.

14 Now, in the full paragraph in the middle
15 of the page, according to the definition of the
16 production forest reserve, you have to modify your
17 harvesting practises in production forest reserve areas
18 but you told me that it is not mandatory to perform an
19 OPC; correct?

20 A. I am looking at as to where it says
21 you have to modify the practises in that paragraph.

22 THE CHAIRMAN: Sorry, would you mind
23 repeating that question, Ms. Seaborn?

24 MS. SEABORN: Yes, Mr. Chairman.

25 Q. If you look at page -- actually we

1 should start on the bottom of page 3, just to be clear.

2 And you talk about the assignment of the
3 production forest reserve representing the
4 interpretation of the physical site conditions, and
5 then you talk about verification of the site
6 conditions. And then you say there may be operational
7 difficulties if timber management activities are
8 carried out in that stand; correct?

9 DR. OSBORN: A. Correct.

10 Q. And so I could infer from that, that
11 that would imply that if there may be timber
12 management -- if there may be operational difficulties
13 you may have to modify your harvesting practises?

14 A. You may have to. Hence, the benefit
15 of a site verification.

16 Q. And then further down you talk about
17 verifying the site conditions in production forest
18 reserve areas, and again you say in the middle of the
19 full paragraph on page 4:

20 "Site conditions are verified before
21 management decisions are made for those
22 stands."

23 A. Agreed.

24 Q. Now, you have said in the
25 Environmental Assessment then that site conditions are

1 verified, but we have discussed the fact that OPCs are
2 not mandatory.

3 So my question is -- and, again, it may
4 be something that you want to deal with in a later
5 panel: What sorts of activities do the field staff do
6 before they take their management decisions with
7 respect to their production forest reserve?

8 A. Well, it may be dealt with later, but
9 I spent some time explaining. In answer to the
10 question of how is the FRI data supplemented, I
11 provided a list of four or five different activities
12 that typically take place in the field of which OPC was
13 one.

14 So there is a variety of circumstances
15 that may give rise to additional information to help,
16 site-by-site, assess whether or not management
17 activities are conducted here and the form and fashion
18 in which they are conducted.

19 And included in that list, for example,
20 we are back to the forest ecological classification
21 system which is intimately associated and intimately
22 related to this particular question and, in fact, as
23 sort of -- in addition to the FEC, which takes place in
24 some regions, it is equivalent in the northeastern
25 region which is - we talked about FLAPS, F-L-A-P-S, and

1 its continuance - the same sort of system, not exactly
2 the same.

3 Again, speaking to: How do I manage any
4 particular site, be it production forest reserve or
5 other.

6 So those additional types of surveys,
7 those additional forms of classification can be used
8 and are used as supplements to enhancing the FRI data
9 to help with that decision-making.

10 Q. Now, you said can be used. Are any
11 of those -- we have determined what the answer is with
12 OPCs. With respect to FECs and FLAPs, are either of
13 those mandatory in the production forest reserve?

14 A. No, these are all tools that the unit
15 forester brings into play to best answer those
16 managerial questions. There is an array of tools that
17 he or she makes use of to best answer those questions.

18 Q. That's right. So you would agree
19 with me then, wouldn't you, that there aren't any
20 mandatory -- that the supplementary information that
21 you talked about in your testimony in-chief is not
22 information that is mandatory within the -- mandatory
23 to be compiled within the production forest reserve;
24 correct?

25 A. Two answers to that question. The

1 first is that we are dealing with a professional and
2 that is part of their background as to speak to those
3 questions. The second is, this is not a unilateral
4 decision; this is a decision made by the planning team
5 representing a wide variety of interested parties as to
6 what should or should not be done in the planning for
7 the area.

8 Q. So we are relying either on the
9 discretion of the unit forester and/or the discretion
10 of the planning team?

11 A. As to which set of tools they apply
12 in each case, yes.

13 Q. Right. And because it is optional,
14 potentially none of the tools could be applied within
15 the production forest reserve; correct?

16 A. It is a possibility.

17 Q. Okay. There is just one other --
18 couple of other questions I had on this area. If you
19 could look again at the Forest Resources of Ontario,
20 1986. And Appendix A to that document begins at page
21 47, and substantially the remainder of the report are
22 these regional summary tables; correct?

23 A. The same tables as presented in the
24 earlier part of the report for the province as a whole.

25 Q. Right. I just wanted to ask you a

1 question of clarification.

2 If you could go first to Table 8 on page
3 48, you will see the third column over we have
4 ownership protection forest and then we have an area
5 called protection forest reserve. I take it that
6 should be production forest reserve?

7 A. I appreciate the editorial. Yes, I
8 hadn't caught that one. Again, without checking the
9 numbers just to make sure, I would presuppose your
10 observation is correct.

11 Q. Well, perhaps you could let me know
12 if I am wrong in that regard and if there is something
13 else that explains the terminology.

14 A. I appreciate the comment.

15 Q. And the remainder of the tables - I
16 won't give all the page numbers - but it refers to
17 protection forest reserve throughout these tables.
18 And, again, if you could just confirm for the Board at
19 some point that we should read this as production
20 forest reserve?

21 A. Will do.

22 Q. We talked about on a stand map
23 protection forest. Just returning again to stand maps,
24 if I looked at one -- a stand map and wanted to see if
25 there were any production forest reserve areas, would

1 it say PFR right on the stand map?

2 A. Stand 524 on Exhibit 85 is labeled
3 PFR, yes.

4 Q. Thank you. I believe your earlier
5 evidence, Dr. Osborn, was that generally operational
6 cruises would be conducted in areas where access
7 already exists; is that correct?

8 A. It is a lot cheaper doing it that
9 way, yes.

10 Q. And I believe -- I don't have the
11 page reference, but I believe you said that normally if
12 there is a road -- where there are roads, it is more
13 likely that the unit forester is going to choose to go
14 into that area to conduct an OPC?

15 A. The observation is valid. I am not
16 sure whether we are mixing up cruising of OPCs versus
17 FRIs, but so far I don't disagree with your comment.
18 Access is a key component and costs a lot of money.

19 Q. And would you agree with me that OPCs
20 could be a useful term in road planning?

21 A. Yes, but a very remote connection,
22 and I may have to explain why I think that that is the
23 comment, so...

24 It is not in a direct sense, but
25 indirectly.

1 Q. Sorry, could you...

2 A. Well, one puts the road in -- roads
3 are expensive to build, so one puts the road in for a
4 variety of circumstances and one of the concerns about
5 putting a road in is to have the most efficient
6 location, however one measures efficiency, in terms of
7 the timber one can access from that road.

8 Now, if the OPC or whatever other form of
9 information can ascertain where there are and what the
10 volumes may be in the areas allocated, it may or may
11 not very indirectly help in where does one put the
12 road. But that is a very far-fetched rationale for why
13 OPCs would be used for road construction -- road
14 location.

15 Q. Is it also - to use your word -
16 far-fetched because it is the general policy that you
17 don't go into an area to do an OPC until you have
18 already got a road there?

19 A. No, not necessarily. OPCs very often
20 are done in an area that is to be cut in the ensuing 1,
21 2, 3, 4, 5-year periods. Now, in terms of timing, the
22 access into that location, the allocated area, may not
23 have happened at this point in time.

24 So the OPC may go into an area in which
25 there is relatively little access. It gets expensive

1 to so do. It depends a little bit on the timing of the
2 road location and the road building in relation to the
3 timing of the OPC. So there is a range which that may
4 cover.

5 Q. And I understand from Mr. Freidin's
6 comments that in Panel 7 we are going to hear more
7 evidence about how OPCs are utilized in collecting
8 information with respect to non-timber values?

9 MR. FREIDIN: Yes, your recollection is
10 correct.

11 MS. SEABORN: Then I will...

12 MR. FREIDIN: Your intended recollection
13 is correct and I accept what your intent tells me.

14 MS. SEABORN: Thank you, Mr. Freidin. I
15 won't --

16 THE CHAIRMAN: What about your
17 recollection?

18 MR. FREIDIN: I don't have any specific
19 recollection of referring to OPCs in Panel 7, but I
20 obviously stand corrected.

21 Q. Dr. Osborn, if you just turn to the
22 Panel 3 evidence which is Exhibit 80 at page 68.

23 THE CHAIRMAN: Exhibit 78.

24 MS. SEABORN: I am sorry, Exhibit 78.
25 Thank you, Mr. Chairman.

1 DR. OSBORN: Page...?

2 MS. SEABORN: Page 68. Oh, I see why I
3 called it Exhibit 80. There is -- for this particular
4 page it was replaced and renamed Exhibit 80, for page
5 68.

6 THE CHAIRMAN: Was it changed on Exhibit
7 80 from what's in Exhibit 78?

8 MS. SEABORN: There were a couple of
9 changes, Mr. Chairman. They are not relevant for my
10 questions, but the page was replaced during
11 evidence-in-chief.

12 MR. FREIDIN: I think the differences,
13 Mr. Chairman, were that there was a line drawn from
14 where it says mature over to the volume access, 125
15 cubic metres written there, and there was a line -- at
16 the bottom a line, a vertical line drawn down from
17 mature, there was 80 years written on the bottom.

18 I think those are the only changes.

19 MS. SEABORN: Q. Now, would you agree
20 with me, Dr. Osborn, that page 68 does not reflect what
21 is termed in the Forest Resources of Ontario as the
22 biological optimum rotation age?

23 DR. OSBORN: A. The actual values on
24 page 68 for the rotation, the rotation of age 80, and
25 the data that I used to work out the volumetric values

1 on page 68 were for spruce site class 2.

2 If you go into the yield tables you will
3 not find that the MAI culminates the spruce site class
4 2 at age 80.

5 THE CHAIRMAN: So what is the answer to
6 the question?

7 MS. SEABORN: I think yes.

8 DR. OSBORN: Well, I am not sure because
9 I think the answer is no, that's really why.

10 THE CHAIRMAN: So it does not reflect
11 what is termed as optimum biological rotation?

12 DR. OSBORN: Exactly, it doesn't.

13 THE CHAIRMAN: It does not.

14 DR. OSBORN: It wasn't intended to. In
15 fact, the value would be a little bit older than that
16 where a line from the origin was a tangent to that
17 curve which would probably be at around 90, 95 to 100.

18 MS. SEABORN: Q. And so just to be clear
19 for the record then, page 68 does not depict the
20 biological rotation age?

21 DR. OSBORN: A. Not for spruce site
22 class 2, and that is really why the word mature is put
23 in speech marks. It is a managerial decision and we
24 talked about how rotations are selected.

25 Q. Now, I understand from your evidence

1 that if the rotation age is shortened you increase the
2 MAD; correct?

3 A. In the arithmetic as described, yes.

4 Q. Now, would you agree with me that
5 reducing the rotation age and increasing the area
6 harvested could have other ramifications, such as
7 accelerating access requirements or increasing renewal
8 efforts?

9 A. If you did increase the MAD then --
10 and the areas were cut, yes, you would increase the cut
11 and you would, therefore, increase the access
12 requirements, yes, and the regeneration effort, yes.

13 Q. And you may also find yourself with
14 increased land use conflicts because larger areas are
15 being harvested; correct?

16 A. Not necessarily, it depends on what
17 increased area we are talking of, whether in fact there
18 was any land use conflicts for that area. So that
19 there is no categorical yes/no answer.

20 Q. No, but it would be logical though,
21 wouldn't it, not to think that if you are going to
22 increase the area that you are harvesting you are more
23 likely to run into more land use conflicts because you
24 are cutting more of the land?

25 A. Proportionally, yes. I don't

1 disagree with the logic.

2 Q. Okay, thank you. If you could just
3 turn to page 114 of your Panel 3 evidence. As I
4 understand your evidence in this diagram on page 114,
5 you were explaining to the Board that as a result of
6 silvicultural efforts a rotation age could be
7 shortened; is that correct?

8 A. Correct.

9 Q. Are there situations where
10 productivity is retarded instead of stimulated as a
11 result of silvicultural practises; that is, your
12 rotation age is actually increased?

13 A. I am hard-pressed to think of an
14 example, and if you do silviculture for the reasons
15 silviculture is done one would hope not. The whole
16 intent of doing silviculture is to enhance the
17 productivity for the site.

18 So I am having difficulty thinking of an
19 example of a practice that deliberately sets about to
20 making productivity lower.

21 Q. Well, suppose you went into do some
22 silvicultural practices in areas where there is shallow
23 soil over bedrock or areas that are classified as NSR 4
24 and 5; isn't there a potential that instead of
25 stimulating productivity you could, in fact, retard

1 productivity on those sites?

2 A. Again, before you made that decision
3 to do that operation you would have to think seriously
4 of what were the probabilities of doing something that
5 was to stimulate it.

6 Now, you talked about NSR 4 and 5.
7 That's a very expensive operation to go into those
8 areas, that's why they are classified NSR 4 and 5. And
9 it is, therefore, before you put up that money you
10 would really want to think carefully: Am I doing
11 something beneficial with those monies.

12 Q. With respect to the choice of the
13 rotation age generally, is this a decision that's made
14 by the unit forester?

15 A. Yes.

16 Q. And on what basis does he make that
17 decision?

18 A. Okay. We went through the four kinds
19 of rotation and typically the first one or two, the
20 maximum productivity or the technical rotation would be
21 the typical ones that are most used in Ontario.

22 So the unit forester will go through for
23 the working group and the site class and look at what
24 the yield table infers, except he would do it in more
25 detail than I went through and some things that I

1 hadn't spoken to he will certainly go through.

2 In the technical sense, again we would
3 look at the product being produced and the length of
4 time it took to produce that product on the average
5 from past experience, past knowledge and looking in the
6 yield tables. Now, those considerations will be the
7 beginning and then we will start to look at: What if
8 anything do we think is going to happen to this stand
9 if we are talking now of a brand new stand: What do
10 we think may happen to that stand and what is our
11 inference is about how we may change its level of
12 productivity.

13 Now, that's relative -- the last part is
14 relatively new because there is only a small part of
15 the Ontario that is under that sort of regime. 90 per
16 cent of Ontario, or whatever the number is, is still
17 the existing forest that grows something similar to the
18 normal yield tables and, therefore, the first two
19 measures of: Where does my MAI culminate, what's the
20 technical level to produce that product, is still very
21 much the driving force in the selection of the
22 rotation.

23 Q. If you would just turn for a moment
24 to the Timber Management Planning Manual, page 9, under
25 Section 2.4.3, determination of rotation or cutting

1 cycle. And it says:

2 "Once the potential silvicultural systems
3 are determined, the appropriate rotation
4 for evenage management systems or cutting
5 cycle for unevenage systems must be
6 selected. This selection is normally
7 based upon established provincial and
8 regional standards but these may be
9 modified by local considerations."

10 What standards are being referred to in
11 the Timber Management Planning Manual?

12 A. The normal yield tables and the
13 understanding of the culmination of the mean annual
14 increment in terms of maximum volume production and
15 again the data that's in the normal yield tables as an
16 indicator of tree size, tree diameter in terms of
17 technical rotation setting.

18 And they would be the provincial overall
19 standards one would start with as the first step.

20 Q. So the standards you are referring to
21 then in the Timber Management Planning Manual are those
22 standards that you gave in your evidence as to the
23 thought process the unit forester goes through in
24 making his determination about rotation age?

25 A. That would be my professional

1 understanding and I didn't write this manual, but if I
2 was to read it the way it was written, that's where I
3 would start as a professional.

4 Q. Well, he may have to come back to it
5 later then. Perhaps at some point when we get into the
6 manual MNR can advise us if there are other standards
7 and we may be able to just do that through an
8 interrogatory.

9 A. Sure.

10 Q. Do you know, Dr. Osborn, what local
11 considerations are being referred to?

12 A. One very obvious one would be
13 technical. If you are trying to supply the veneer mill
14 and a veneer mill requires veneer bolts, trees of a
15 size that is 30 centimetres, then that may well be a
16 local variation or local product requirement that is
17 different from the overall provincial norm for the
18 veneer bolts; that mill happens to have technology that
19 uses that size trees. So that's a consideration for
20 local variation that's most obvious.

21 Q. And, Dr. Osborn, in response to a
22 question yesterday from Mr. Castrilli I believe you
23 said that if you are changing a rotation age you should
24 have reasons or rationale for doing so, if I can just
25 paraphrase what your evidence was. Is that

1 substantially correct?

2 A. Oh yes.

3 Q. And are the reasons or rationale for
4 shortening the rotation age documented as a general
5 rule in a timber management plan?

6 A. I am not familiar with the details,
7 but as a professional again, I would certainly hope so.
8 I think that's what I said to Mr. Castrilli.

9 Q. I expect we will get into the details
10 of documentation when we reach that section of the
11 evidence?

12 A. Yes.

13 Q. Thank you. Mr. Armson, during your
14 evidence-in-chief you were discussing the sorts of
15 things which could cause a shortfall or deficit
16 situation to occur on a management unit.

17 Do you recall that discussion?

18 MR. ARMSON: A. I certainly do.

19 Q. And I believe your testimony was that
20 if there is a deficit on the unit probably the first
21 consideration would be whether there was a supply of
22 wood from an adjoining unit that could be used to make
23 up the deficit?

24 A. That is correct.

25 Q. Would you agree that you can also

1 change your rotation age to make up the deficit?

2 A. No, I don't believe that would
3 normally be a rationale that would stand up. I would
4 certainly be critical of it.

5 Q. Why is that?

6 A. Because changing the rotation age
7 would call for an explanation and, as Dr. Osborn had
8 said, from far more than just making up a deficit.

9 You may make up a deficit in the short
10 run, as I explained, by cutting more in that short
11 period, but as I also explained, you would to have some
12 rationale for the longer run. And in setting a
13 rotation age, you are looking at the longer run.

14 So I would look for something more
15 substantial as an explanation in making up the deficit.

16 Q. So then, you would go to an adjoining
17 unit or employ one of the other mechanisms that you
18 referred to in your evidence rather than change a
19 rotation age to make up a deficit?

20 A. That is correct.

21 Q. Could you, for example, substitute
22 saw logs for roundwood to make up a deficit in
23 roundwood?

24 A. No, roundwood is a generic term and
25 includes saw logs.

1 Q. Okay. And when you were discussing
2 the MAD calculation in front of the Board, your
3 evidence I believe was that the forest manager decides
4 whether to exceed MAD; is that correct?

5 A. Yes. As I explained, in the
6 five-year projection where the forecasted demand was
7 greater than the calculated MAD, then the manager had
8 some cause to see how he would deal with that first of
9 all, as was indicated earlier in answer to your
10 question, whether there would be substitution from
11 outside the unit, or whether in fact in the short run
12 it might be exceeded in the five years, but with the
13 proviso and with an understanding that in the longer
14 run that would be balanced off either by a change in
15 the amount or the manner of the material going to the
16 mill in some other form or in some other species.

17 Q. Do any guidelines or provincial -- or
18 procedural directives exist for reference by the forest
19 manager as to the procedure for exceeding MAD?

20 A. Not to my knowledge.

21 Q. So then it is professional judgment?

22 A. It would be a managerial decision,
23 yes.

24 Q. Based on the unit forester's
25 background and his judgment and knowledge of the unit?

1 A. On his judgment, knowledge and also
2 in discussion with the mill and the industry affected
3 and with other individuals within the Ministry, because
4 it would be concerned with possible other units within
5 the region.

6 DR. OSBORN: Q. And the MAD calculation
7 would show the implications of the calculation not only
8 for the five-year period, but for ensuing periods.

9 Q. Mr. Armson, I understand that timber
10 management activities do not occur in parks in the area
11 of the undertaking other than Algonquin park management
12 unit and Lake Superior park management unit?

13 MR. ARMSON: A. Yes, in terms of the
14 production of timber. There may be activities in other
15 parks which result in the felling of trees, but I
16 believe they wouldn't normally be considered as part of
17 this.

18 Q. What do you mean -- what do you
19 suggest when you say activities in terms of felling
20 trees?

21 A. It is my understanding there may be
22 what more broadly might be termed vegetation management
23 in parks which may involve the cutting of trees and, as
24 a result, may be firewood and so on, but that's not
25 part of the undertaking as I understand it.

1 Q. Okay. And within the Algonquin park
2 management unit and the Lake Superior park management
3 unit are activities carried out in these parks pursuant
4 to the Timber Management Planning Manual?

5 A. Yes, they fall under the same Timber
6 Management Planning Manual but also within the master
7 plans for the parks.

8 Q. So for timber management activities
9 within those two parks, you would have to look at the
10 parks policies as well?

11 A. I don't know that the parks policies
12 will talk about the specific activities. They will --
13 the timber management takes place within the context of
14 the master plan and that again, of course, reflects the
15 existing parks policy.

16 Q. And if MNR wanted to conduct timber
17 management activities in other provincial parks within
18 the area of the undertaking, would MNR merely have to
19 identify those activities in the timber management plan
20 for the particular unit?

21 A. It is my understanding that timber
22 management activities according to parks policy are not
23 permitted in other than the two parks you named.

24 Q. So what MNR would have to do then to
25 conduct timber management activities within other parks

1 would be to have some sort of -- to obtain an amendment
2 of the parks policy, for example?

3 A. I would presume that. I...

4 Q. So it is not your understanding that
5 an approval for this Environmental Assessment would
6 allow MNR to conduct timber management activities in
7 provincial parks?

8 A. It is my very clear understanding
9 that is the case.

10 MS. SEABORN: Just one moment, Mr.
11 Chairman. Those are all my questions.

12 Thank you.

13 THE CHAIRMAN: Thank you.

14 Well, Mr. Freidin, where do we stand with
15 respect to your re-examination; tomorrow morning?

16 MR. FREIDIN: Yes. I understand that the
17 other presentation -- we can wait until tomorrow
18 morning. I can advise you that we can probably make
19 arrangements to catch the afternoon plane. I don't
20 think I will be more than an hour, hour and a half.

21 THE CHAIRMAN: In the afternoon?

22 MR. FREIDIN: Tomorrow morning. I
23 understand the other matter, the site visit, will only
24 take a half an hour to an hour, so we should be
25 finished by the normal noon break tomorrow, so...

1 THE CHAIRMAN: And we have already made
2 the arrangements. I was wondering whether you had an
3 earlier plane to catch?

4 MR. FREIDIN: I was hoping to say you can
5 leave on the six o'clock flight, but I can't say that.

6 THE CHAIRMAN: Okay, ladies and
7 gentlemen, why don't we start tomorrow at 8:30 in the
8 morning and finish we do. Hopefully it will be around
9 noon.

10 Thank you.

11 MR. FREIDIN: If I might, I have got a
12 couple of filings. The undertaking that was given the
13 other day to Mr. Castrilli about checking planned
14 versus actual and that sort of thing, the new directive
15 for the Board was to provide that in writing, so I have
16 provided that in writing.

17 Perhaps while I am doing that -- perhaps
18 while Ms. Seaborn is here, that she can provide me with
19 exactly what she wanted in relation to the other
20 subject matter.

21 DR. OSBORN: Site class 4.

22 MR. FREIDIN: Site class 4.

23 MS. SEABORN: That's fine.

24 MR. FREIDIN: And just for Mr. Castrilli,
25 he asked for the document in relation to operational

1 cruise and the methods used. I am providing him with a
2 document entitled: Operational Survey, Instructions
3 for Recording Procedures. I can give one to Mr.
4 Castrilli and I can give one to the Board so they can
5 make it available in the reading room.

6 If somebody really wants one after they
7 see it, then they should contact me.

8 THE CHAIRMAN: Very well. So this
9 document here, we should probably admit as an exhibit;
10 should we not?

11 MR. FREIDIN: I am content that it be
12 marked as an exhibit.

13 THE CHAIRMAN: Okay. So that document
14 will be Exhibit No. 133.

15 And it is entitled: Operational Survey,
16 Instructions for Recording Procedures and it appears to
17 be dated -- is that June 28th, 1983?

18 DR. OSBORN: I think so, Mr. Chairman, or
19 something close to that.

20 THE CHAIRMAN: All right. Why don't we
21 call it 1983.

22 ---EXHIBIT NO. 133: Document entitled: Operational
23 Survey, Instructions for
24 Recording procedures dated June
28, 1983.

25 THE CHAIRMAN: We are going to need I

1 think, Mr. Freidin, at least two more copies of this
2 document. One can go in the reading room and we will
3 have one for the record file and one for the Board.

4 MR. FREIDIN: Yes, right, that's
5 understood. I wasn't sure it was going to be marked as
6 an exhibit, that's why I didn't make extra copies
7 available, but I will provide the Board with the
8 document.

9 THE CHAIRMAN: Very good.

10 MR. FREIDIN: Two more or three more?

11 THE CHAIRMAN: I think two more is
12 probably sufficient.

13 Mr. Castrilli?

14 MR. CASTRILLI: I want to check my notes
15 with respect to request No. 1.

16 THE CHAIRMAN: Okay. Do you want to do
17 that and let's deal with that very quickly first thing
18 in the morning to get this out of the way.

19 MR. CASTRILLI: Sure. Thank you.

20 THE CHAIRMAN: Very well, ladies and
21 gentlemen. We will adjourn until 8:30 tomorrow
22 morning.

23 Thank you.

24 Mr. Freidin, one last thing. Other than
25 the boots, do we need to be purchasing anything else?

1 MR. FREIDIN: I think Mr. Kennedy has a
2 list and we will provide it as part of the orientation
3 tomorrow.

4 THE CHAIRMAN: Okay.

5 ---Whereupon the hearing adjourned at 12:35 p.m., to
6 reconvene on Wednesday, July 13th, 1988, commencing
at 8:30 a.m.

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E R R A T A

VOL. XXIII:

Page No.

- 3937- line 8: for "MR. ARMSTRONG", please read:
"MR. ARMSON".
- 3938- line 8: for "MR. ARMSTRONG", please read:
"MR. ARMSON".
- 3943- lines 7 & 20: for "MR. ARMSTRONG", please read:
"MR. ARMSON".

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- 4285 - line 17: for "MR. FREELAND", please read:
"MR. FREIDIN".

